

SCIENCE
Sample Question Paper 17
Class X | Code 086 | 2026-27

Time Allowed: 3 hours

Maximum Marks: 80

General Instructions

This paper has 39 questions in three sections: A Biology, B Chemistry and C Physics.

All questions are compulsory. Three internal choices are provided in each section; attempt only one alternative wherever a choice is given.

Marks are shown against each question. Draw neat labelled diagrams wherever required.

For Questions 8, 9, 24 and 32, use the Assertion–Reason codes below:

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true.

SECTION A

(Biology | Questions 1–16 | 30 marks)

- 1. Which vessel normally carries blood away from a kidney after filtration? [1]**
(A) Renal vein (B) Ureter
(C) Renal artery (D) Pulmonary artery
- 2. A gap between two neurons is a: [1]**
(A) nephron (B) stoma
(C) alveolus (D) synapse
- 3. Which set consists entirely of plants commonly propagated vegetatively? [1]**
(A) Pea, gram and rice (B) Bean, lentil and wheat
(C) Potato, ginger and sugarcane (D) Wheat, mustard and maize
- 4. The part of a seed that develops into the shoot is the: [1]**
(A) micropyle (B) plumule
(C) radicle (D) seed coat
- 5. During photosynthesis, what happens to carbon dioxide and water as glucose is formed? [1]**
(A) Carbon dioxide gains hydrogen, while water loses electrons.
(B) Carbon dioxide loses oxygen, while water gains oxygen.
(C) Carbon dioxide is oxidised, while water is reduced.
(D) Both carbon dioxide and water undergo reduction.

6. During urine formation, tubular reabsorption and secretion take place in the kidneys. Which of the following sets correctly indicates both the substances that are reabsorbed in the kidneys? [1]

- (A) Glucose and salts (B) Glucose and starch
(C) Glycogen and salts (D) Glycogen and starch

7. Which statement correctly compares biodegradable and non-biodegradable waste? [1]

- (A) The latter always supplies nutrients immediately
(B) Only the latter contains carbon
(C) Microorganisms can break down the former more readily
(D) Both are always equally toxic

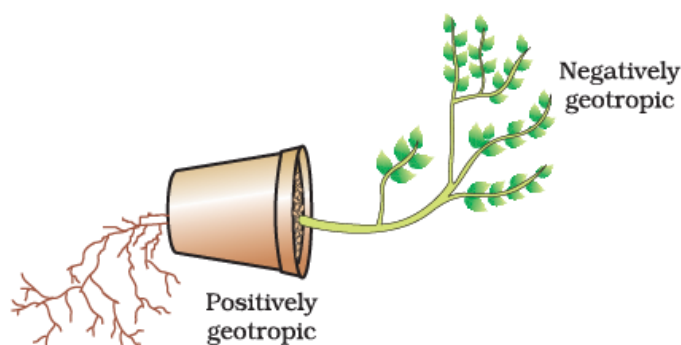
8. Assertion (A): A nerve impulse normally travels from the axon towards its own dendrites.

Reason (R): A neuron usually receives information at its dendritic end. [1]

9. Assertion (A): Removing all producers would eventually affect carnivores too.
Reason (R): Food chains depend on energy trapped by producers. [1]

10. Attempt either A or B. [2]

A. The pot in the figure has been laid on its side. Explain the different growth directions of root and shoot. (2)



OR

B. Why is the response shown a growth movement rather than a rapid folding movement? (2)

11. Give two advantages of vegetative propagation in cultivation. [2]

12. Attempt either A or B. [2]

A. Why can an inherited recessive disorder appear in a child whose parents do not show it? (2)

OR

B. Why does a Mendelian F_2 phenotypic ratio differ from its genotypic ratio? (2)

13. Attempt either A or B. [3]

A. A town replaces disposable plastic plates with washable steel plates. Explain three advantages of repeated reuse. (3)

OR

B. Compare reuse and recycling of a bottle and explain the need for segregation. (3)

14. Give three differences between sexual and asexual reproduction. [3]

15. A Tiwari Academy genetics activity crosses BB black-furred animals with bb white-furred animals, assuming simple dominance. (a) Give F_1 genotype. (b) Give its phenotype. (c) Predict F_2 genotype and phenotype ratios after F_1 interbreeding. [4]

16. Describe three stomach secretions and their functions. [5]
How does chewing improve digestion? (2)

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. The heteroatom present in ethanol is: [1]

- | | |
|--------------|--------------|
| (A) oxygen | (B) nitrogen |
| (C) chlorine | (D) sulphur |

18. The gas formed when most metal carbonates react with dilute acids is: [1]

- | | |
|--------------|--------------------|
| (A) chlorine | (B) oxygen |
| (C) ammonia | (D) carbon dioxide |

19. Electrical wires made of aluminum [1]

- (A) corrode easily as aluminium is a very reactive metal.
(B) corrode easily because porous flaky aluminium oxide is formed.
(C) do not corrode easily as aluminium oxide forms a protective layer.
(D) do not corrode easily as aluminium is less reactive than metals like sodium, magnesium and zinc.

20. The common name of sodium chloride is: [1]

- | | |
|--------------------|-----------------|
| (A) caustic potash | (B) common salt |
| (C) quicklime | (D) slaked lime |

21. Which mixture is used as aqua regia? [1]

- (A) Concentrated HCl and HNO_3 in 3:1 volume ratio
(B) Dilute HCl and water in 1:3 ratio
(C) NaOH and ethanol in 3:1 ratio
(D) H_2SO_4 and NaCl in 1:1 ratio

22. The chemical reaction of an ester with an alkali to form alcohol and a salt is: [1]

- (A) hydrogenation (B) fermentation
(C) rusting (D) saponification

23. Which reactant combination produces sodium chloride and water directly? [1]

- (A) Na_2CO_3 and CaCl_2 (B) CH_4 and O_2
(C) HCl and NaOH (D) H_2 and O_2

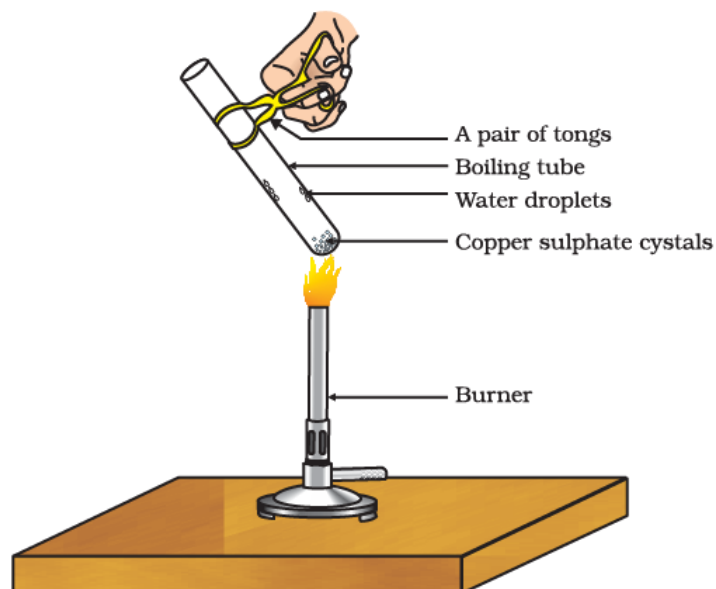
24. Assertion (A): Carbon can form a large number of compounds.
Reason (R): It exhibits tetravalency and catenation. [1]

25. What is isomerism? Give an example from four-carbon hydrocarbons. [2]

26. Write equations for ethanol reacting with sodium and undergoing dehydration.
Name the gaseous products. [3]

27. Attempt either A or B. [3]

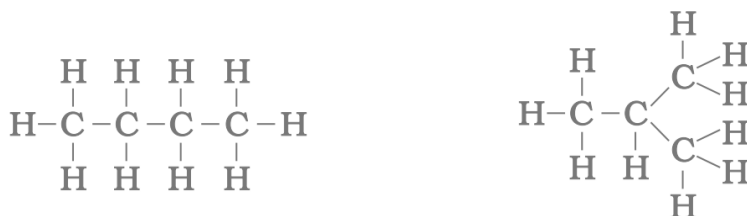
A. The hydrated copper sulphate shown is heated. Explain the colour change, the droplets and what happens after adding water to the cooled solid. (3)



OR

B. Explain what the copper-sulphate experiment reveals about water of crystallisation, including its fixed quantity. (3)

28. The figure shows two four-carbon structures. (a) State their common molecular formula. (b) Name the relationship between them. [4]



Attempt either A or B for the remaining 2 marks.

A. Explain the structural difference and why it is not merely a different drawing orientation. [2]

OR

B. Why does propane not have an analogous branched-chain isomer? [2]

29. Explain how washing soda and baking soda differ in formula, water of crystallisation and one use. [5]

Attempt either A or B for the remaining 2 marks.

A. Write the conversion of baking soda to sodium carbonate and explain crystallisation. [2]

OR

B. Explain how baking powder differs from baking soda. [2]

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. A rheostat is used to: [1]

(A) measure charge directly

(B) stop all magnetic effects

(C) convert AC to DC

(D) vary the current in a circuit

31. An electrical appliance rated 1000 W is operated at 250 V. What current does it draw? [1]

(A) 0.25 A

(B) 2.5 A

(C) 4.0 A

(D) 10 A

32. Assertion (A): The equivalent resistance of parallel resistors exceeds every branch resistance.

Reason (R): Adding a parallel branch provides an additional path for current. [1]

33. When does a short circuit occur, and what happens to current then? [2]

34. Attempt either A or B. [2]

A. Why is the field inside a long current-carrying solenoid nearly uniform? [2]

OR

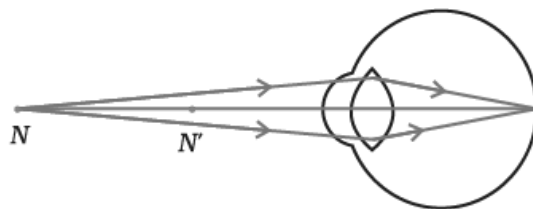
B. How would inserting a soft iron core change a solenoid's field and its practical use? [2]

35. Explain the working of an electric fuse and state where it is connected. [3]

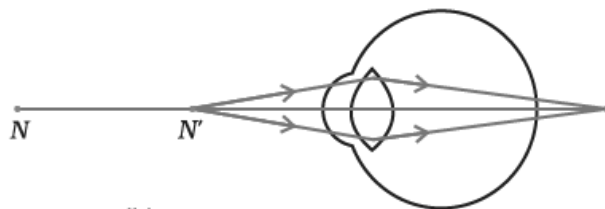
36. A. State the Right-Hand Thumb Rule and describe how it helps determine the direction of magnetic field around a current-carrying conductor.

B. Explain how the magnetic field changes with distance from the conductor. [3]

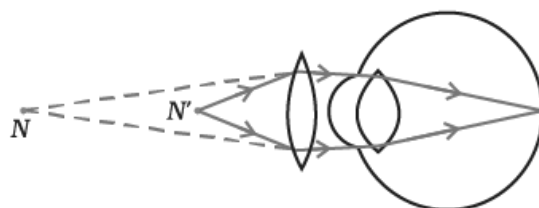
37. In the illustrated defect, a person's near point is 100 cm. Find the power needed to view an object at 25 cm, taking the corrective lens close to the eye. [3]



(a) Near point of a Hypermetropic eye



(b) Hypermetropic eye



(c) Correction for Hypermetropic eye

38. A person's near point is 75 cm. A reading lens is used close to the eye to view a page at 25 cm. Find the desired image distance, focal length and power. [5]

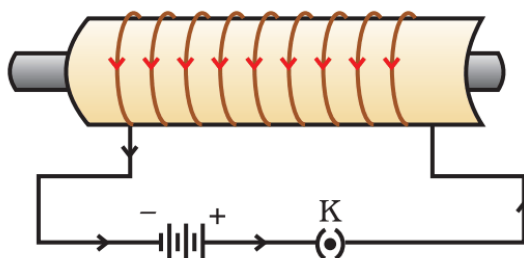
Attempt either A or B for the remaining 2 marks.

A. Explain why a convex lens helps and why the image for the eye is virtual.

OR

B. How can ageing reduce accommodation even without a change in eyeball length?

39. The coil has a soft iron core as shown. (a) Name the device. (b) What happens when the key is opened? [4]



Attempt either A or B for the remaining 2 marks.

A. Explain two ways to increase its strength without replacing the core material. (2)

OR

B. Why is soft iron better than a strongly retentive material for a lifting magnet that must release its load? (2)